



SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES



Coimbatore -641035

COURSE NAME : PHARMACOLOGY(ER20-21 T)

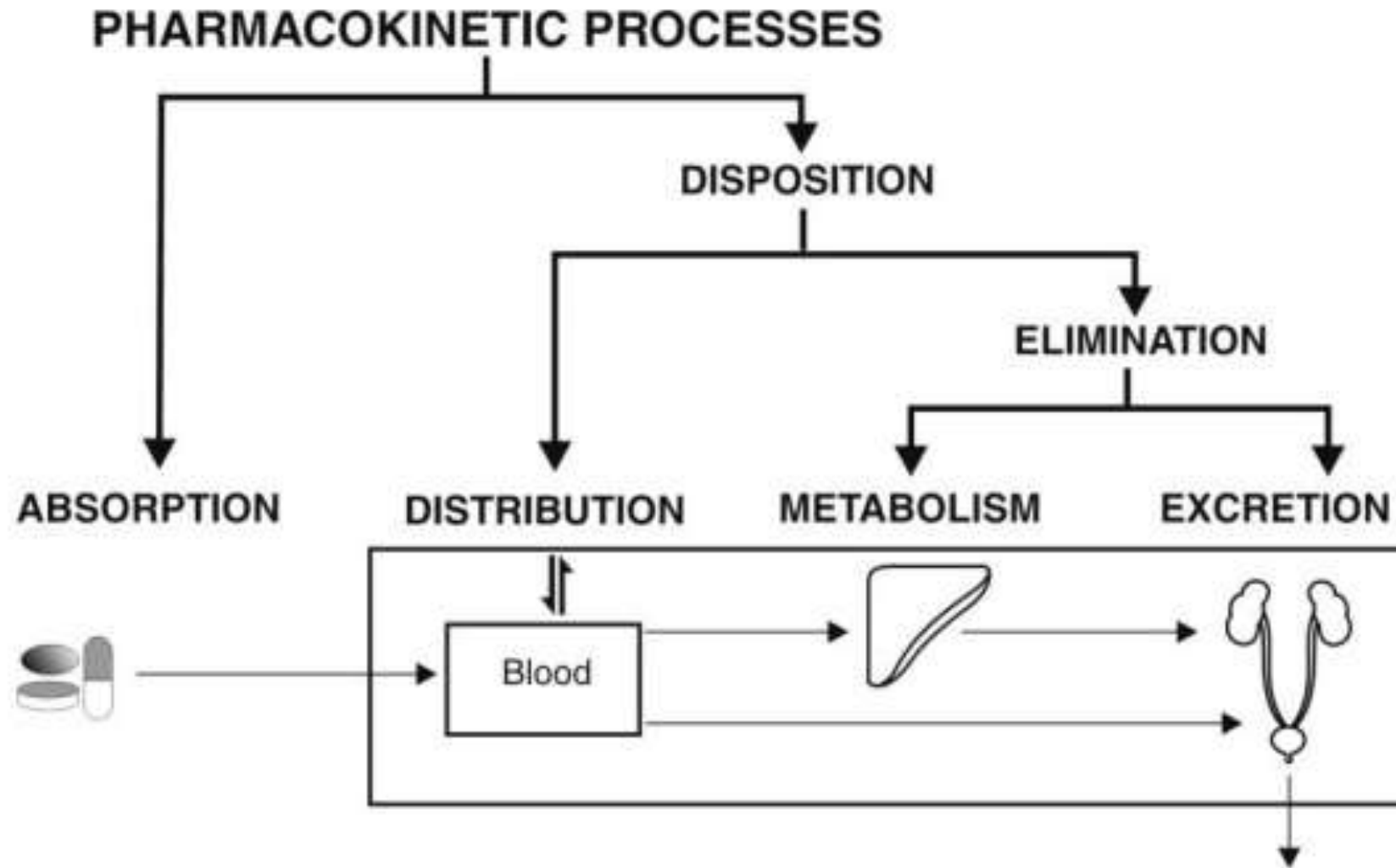
YEAR : DPHARM-II YEAR

TOPIC 4 : PHARMACOKINETICS (ABSORPTION)

DESIGN THINKING IN ABSORPTION

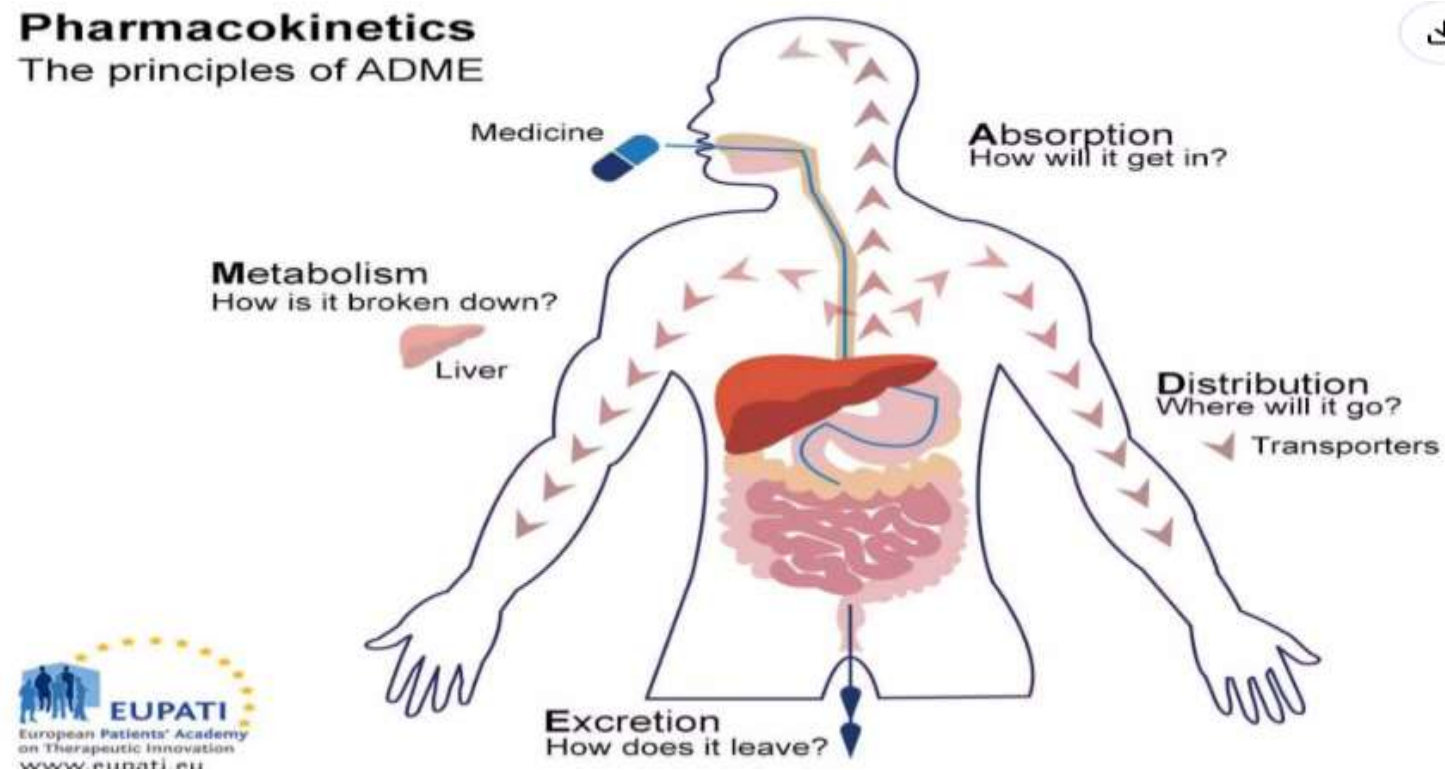
- **Empathize:** Deeply understand the user or patient's challenges, needs, and experiences related to drug administration and absorption.
- **Define:** Reframe the problem based on insights from the empathize phase and establish clear context.
- **Ideate:** Brainstorm and explore a wide range of ideas and potential solutions, including innovative formulations or routes that enhance absorption.
- **Prototype:** Simulate and build drug delivery prototypes to improve bioavailability and patient compliance.

MINDMAP

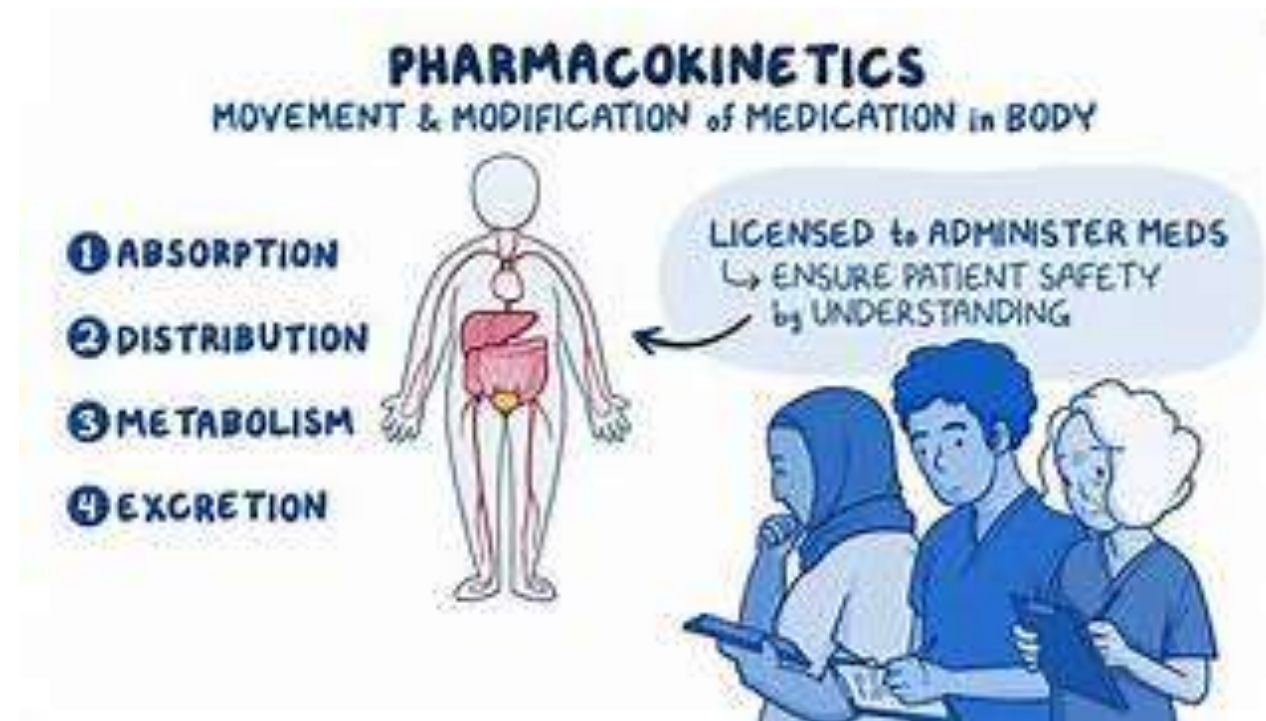


INTRODUCTION

Pharmacokinetics The principles of ADME

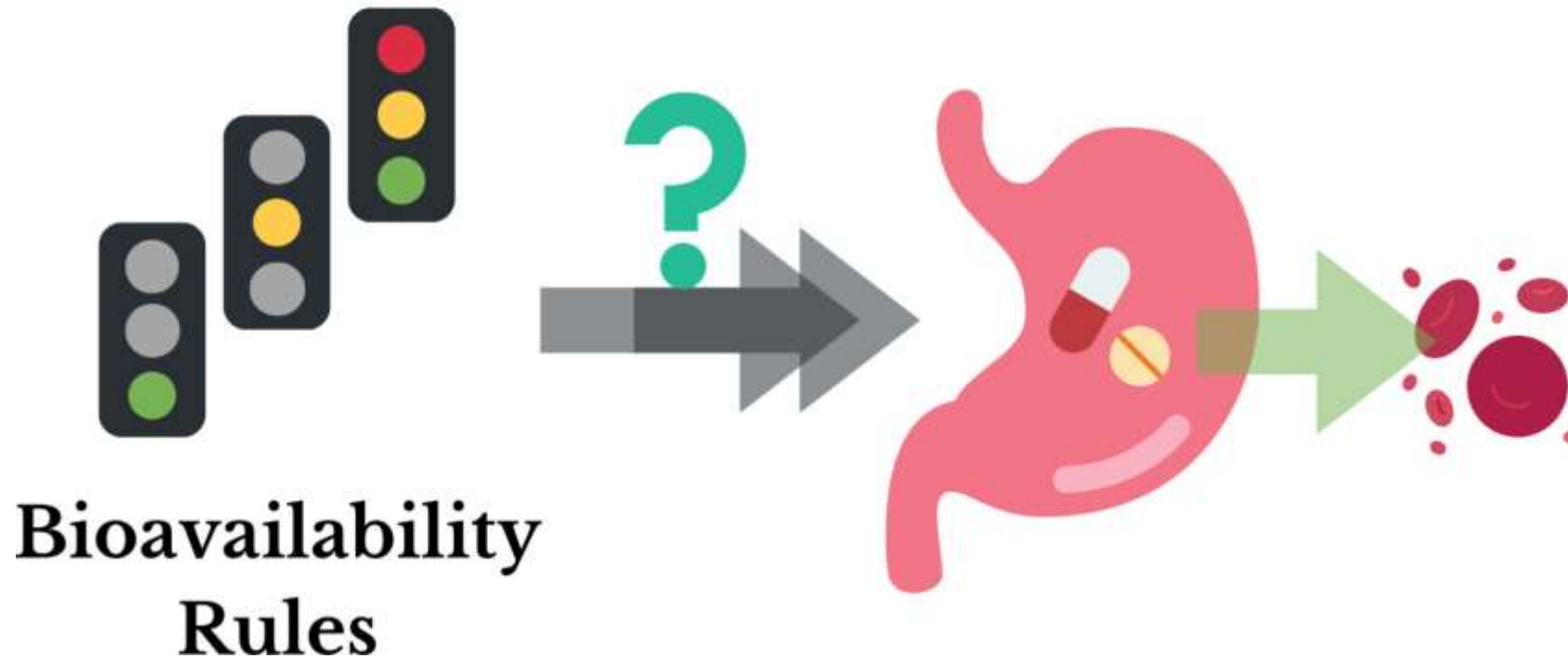


UNDERSTANDING PHARMACOKINETICS

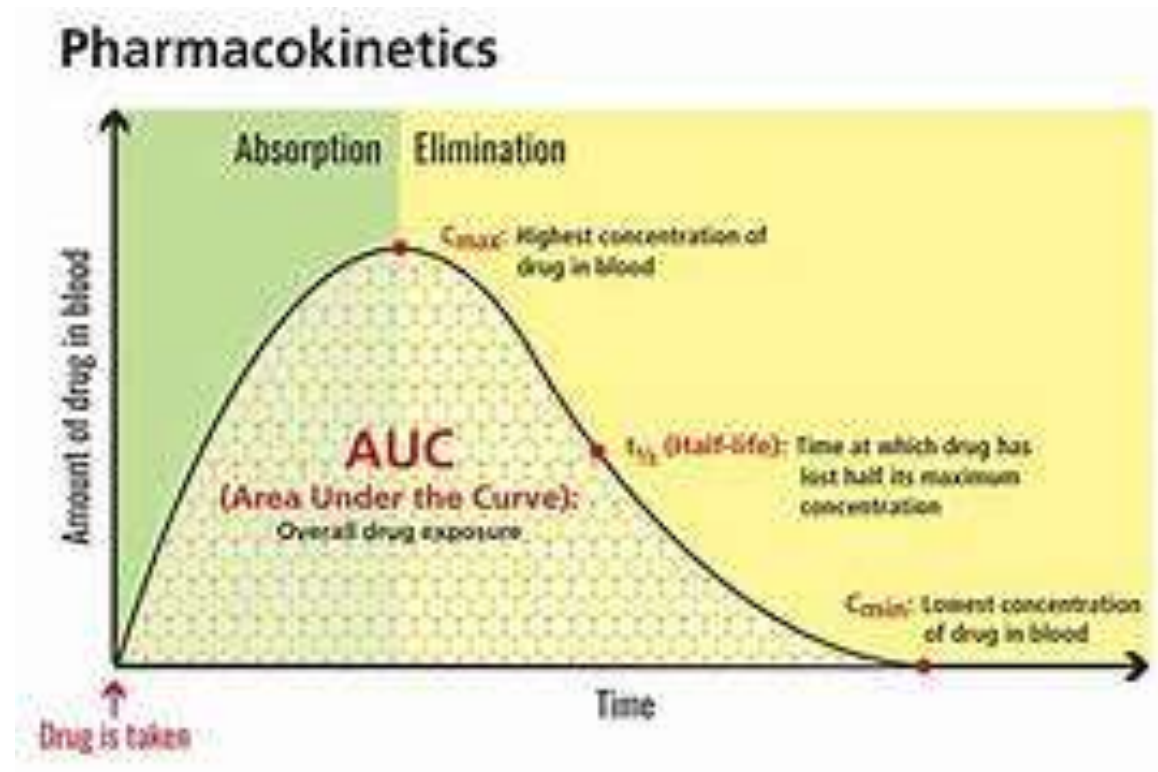


ABSORPTION

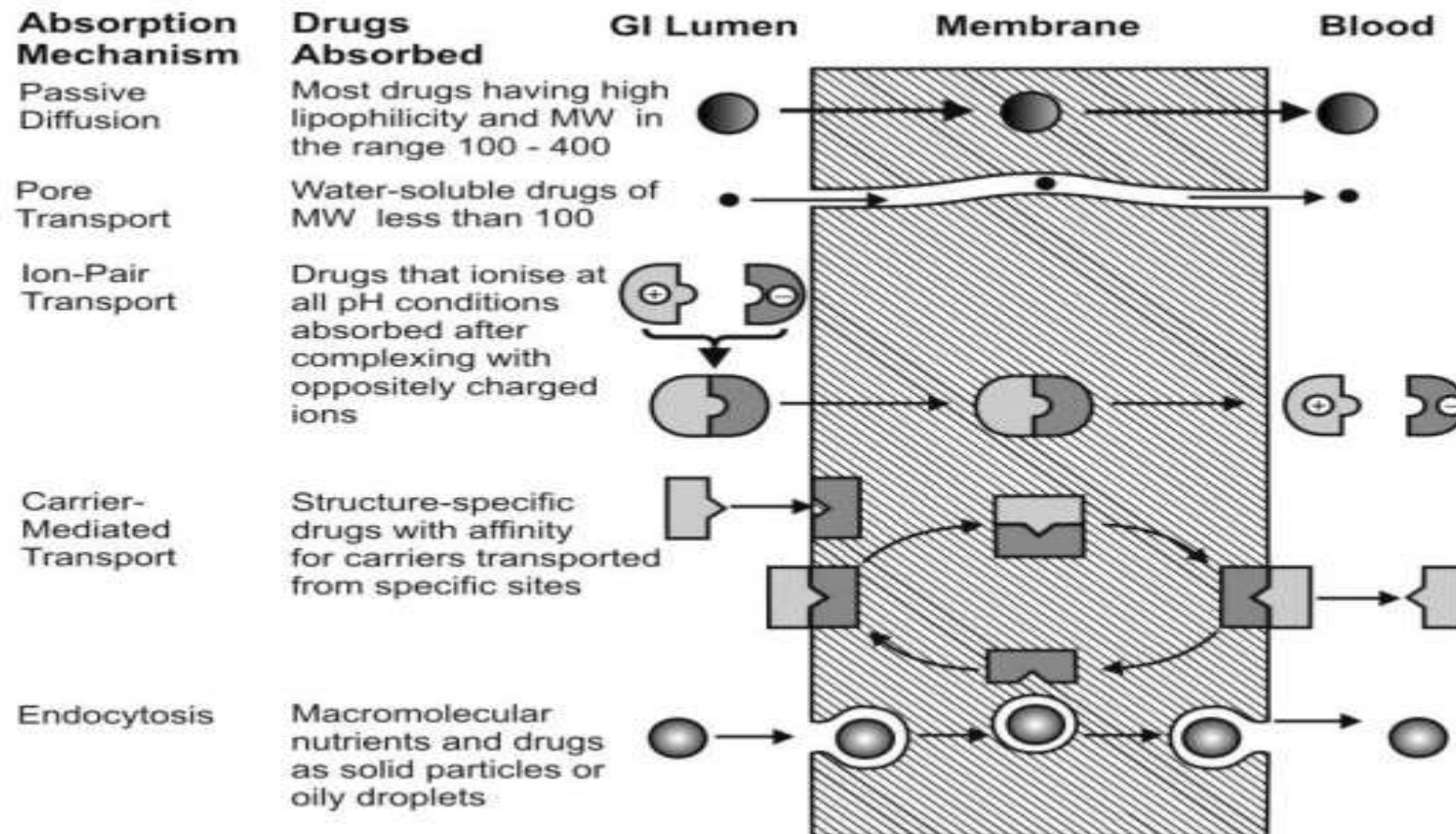
Absorption matters



TERMINOLOGY USED IN PHARMACOKINETICS AND ABSORPTION

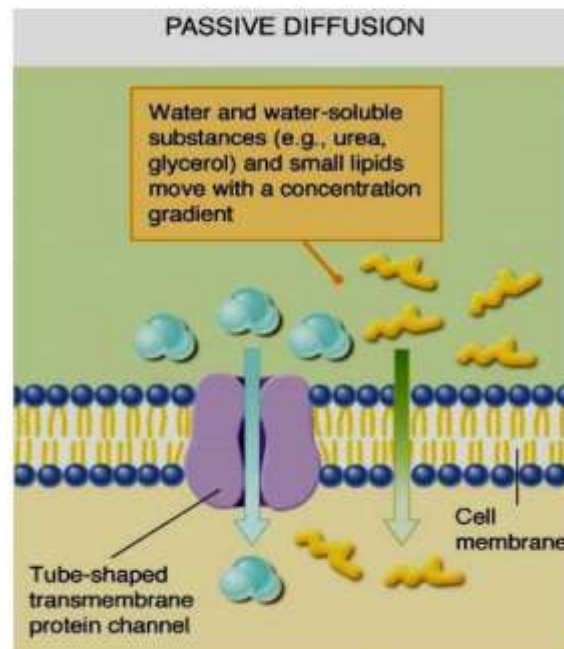


MECHANISMS OF DRUG ABSORPTION



PASSIVE DIFFUSION

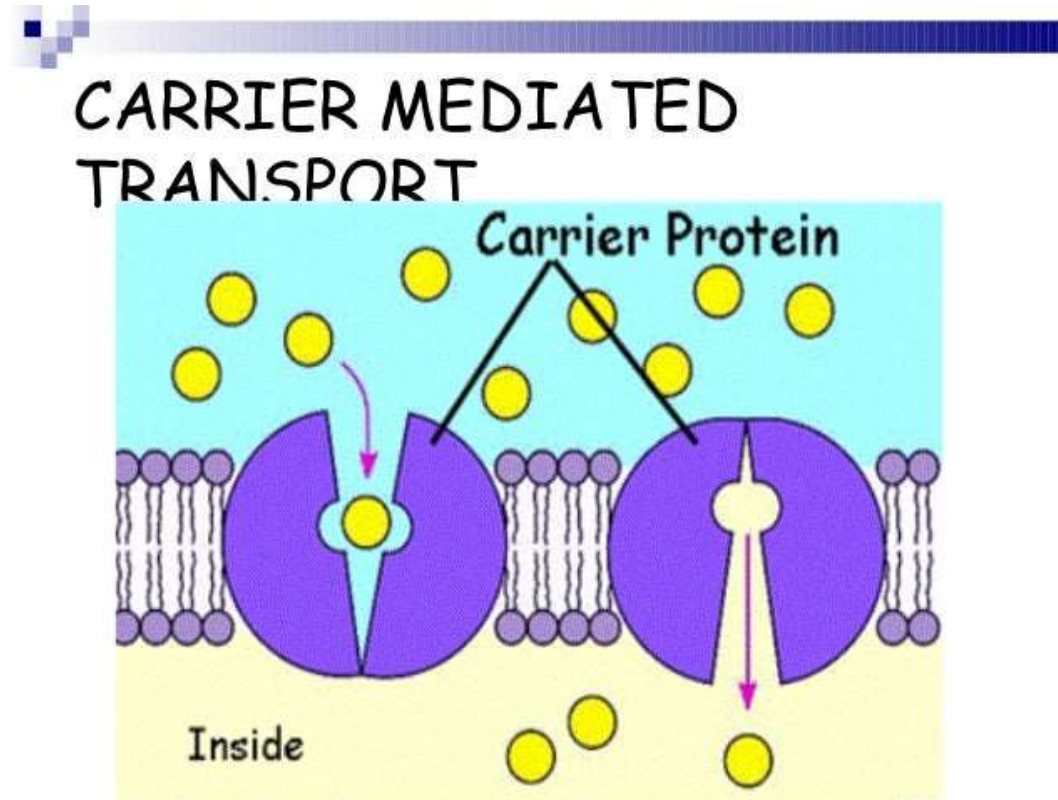
1) PASSIVE DIFFUSION



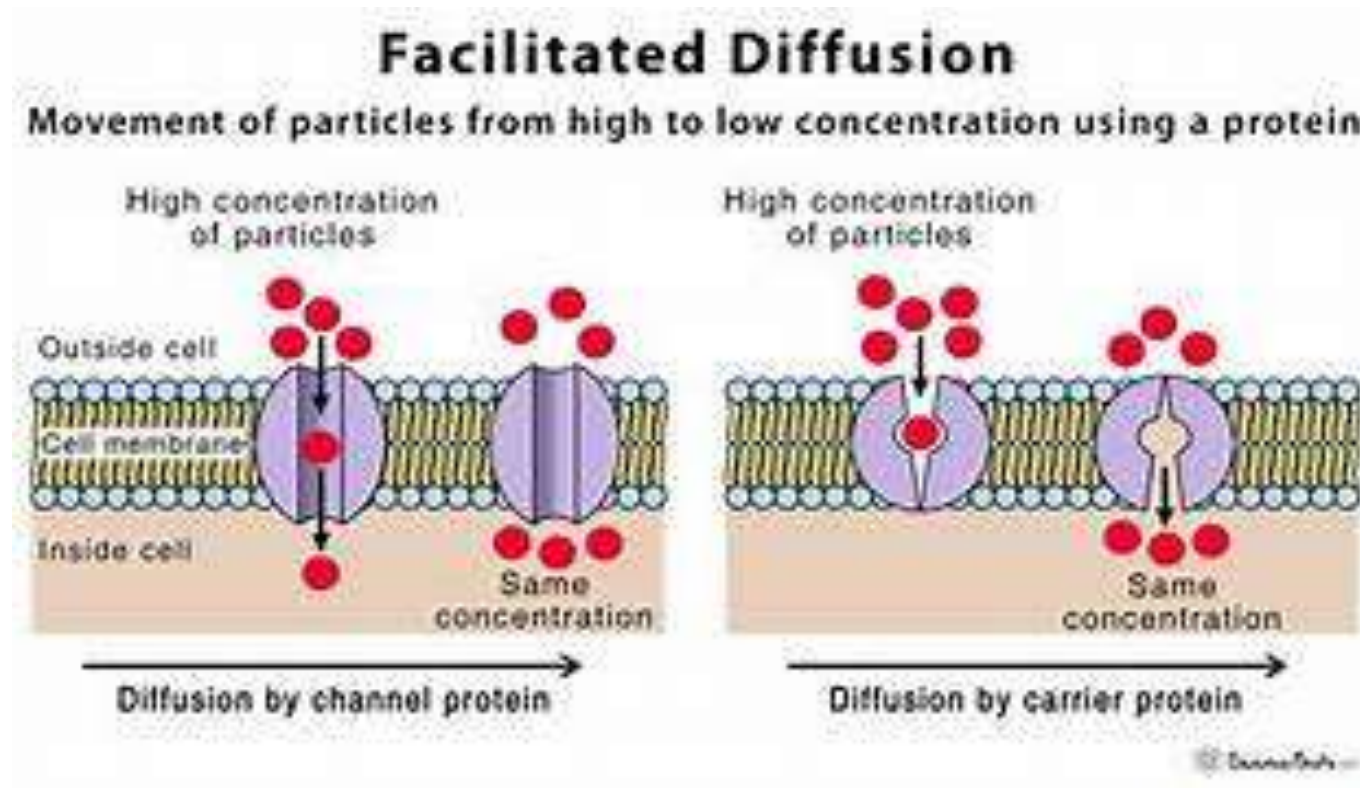
- Also known as non-ionic diffusion.
- It depends on the difference in the drug concentration on either side of the membrane.
- Absorption of 90% of drugs.
- The driving force for this process is the concentration or electrochemical gradient.

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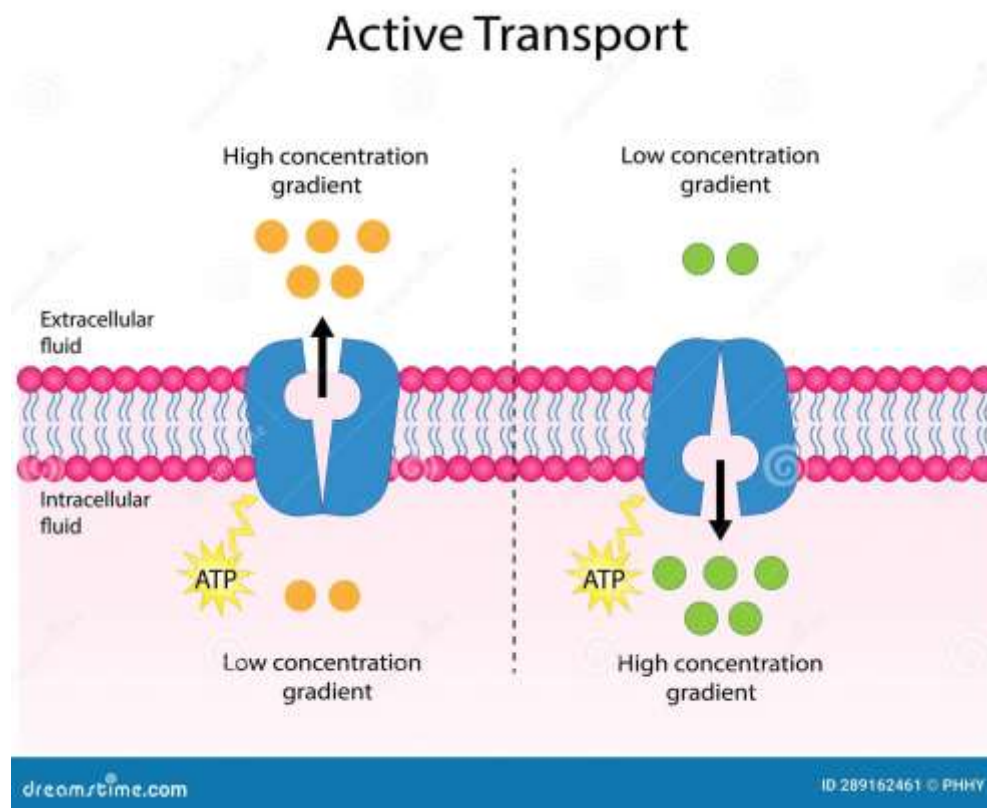
CARRIER-MEDIATED TRANSPORT



FACILITATED DIFFUSION



ACTIVE TRANSPORT



ION-PAIR TRANSPORT

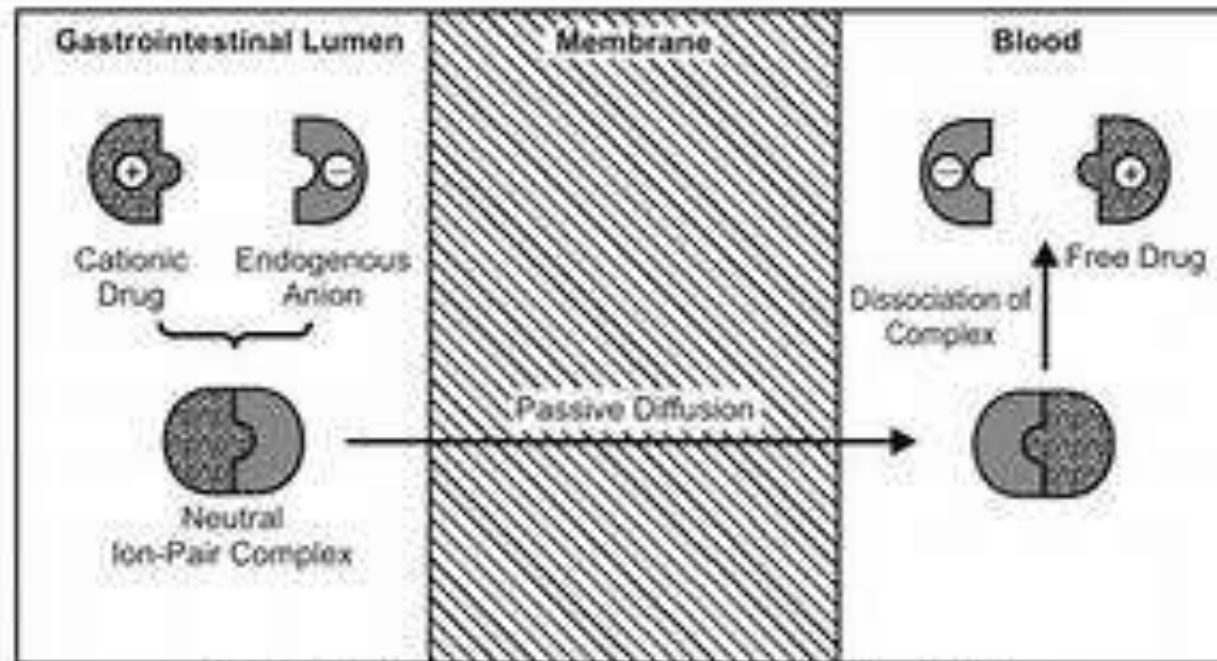
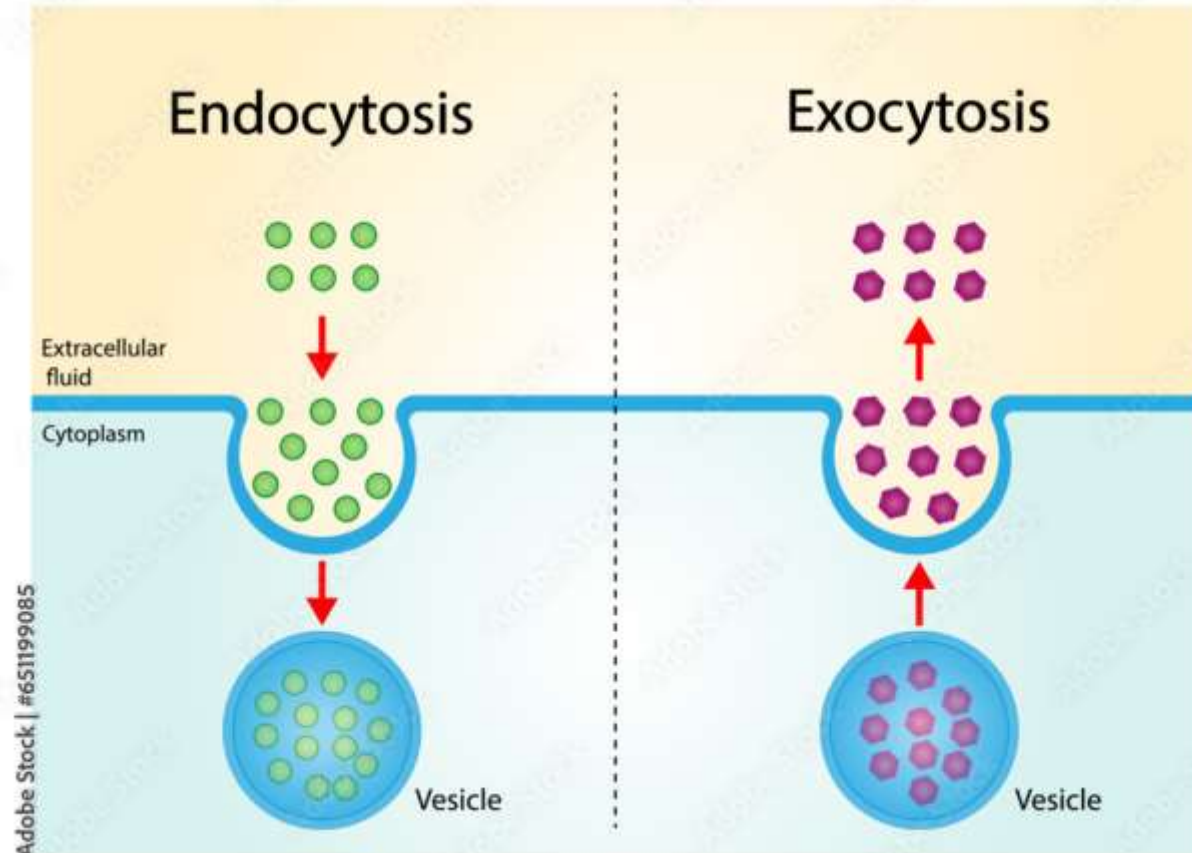
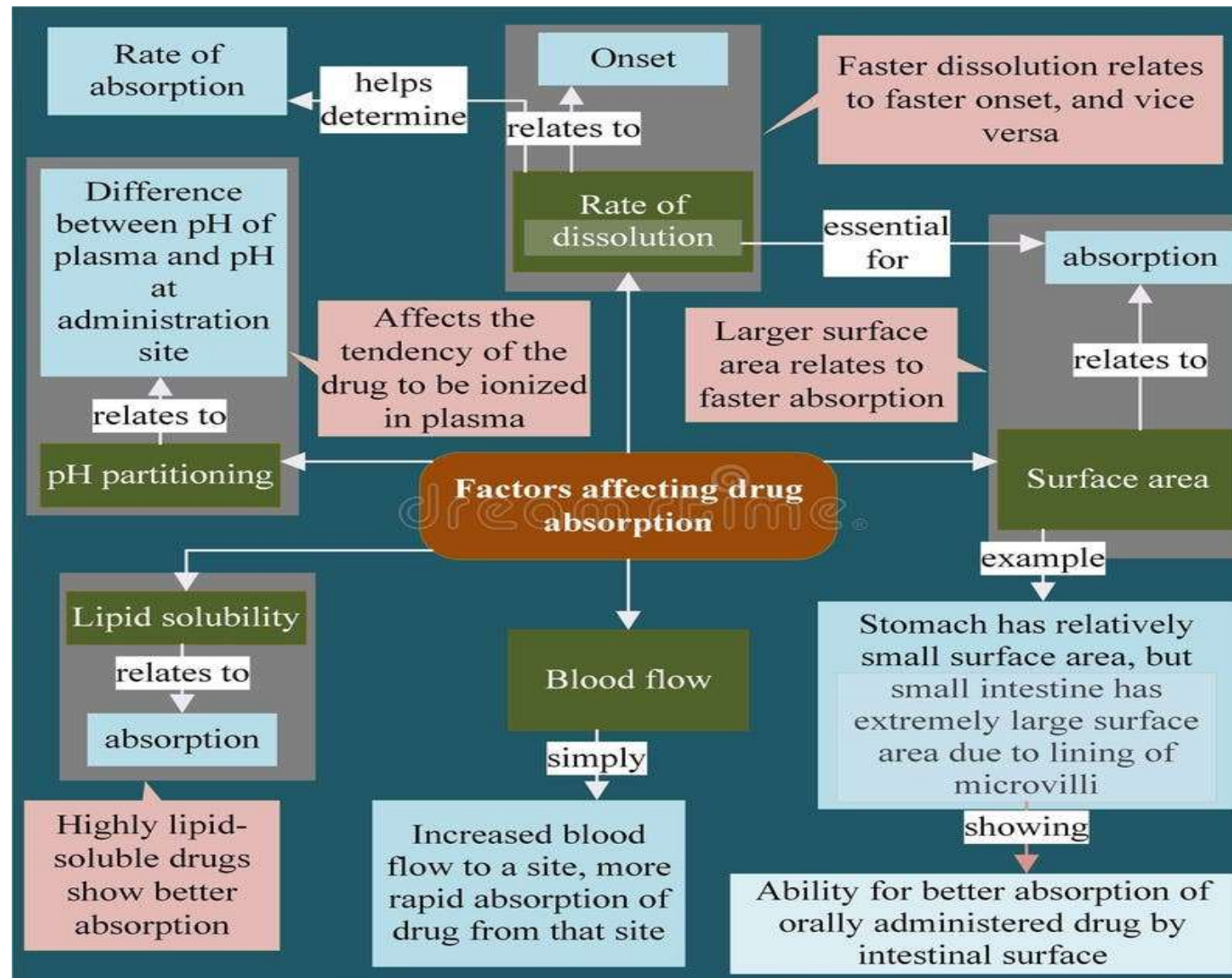


Fig. 2 5. Ion-pair transport of a cationic drug

ENDOCYTOSIS AND EXOCYTOSIS



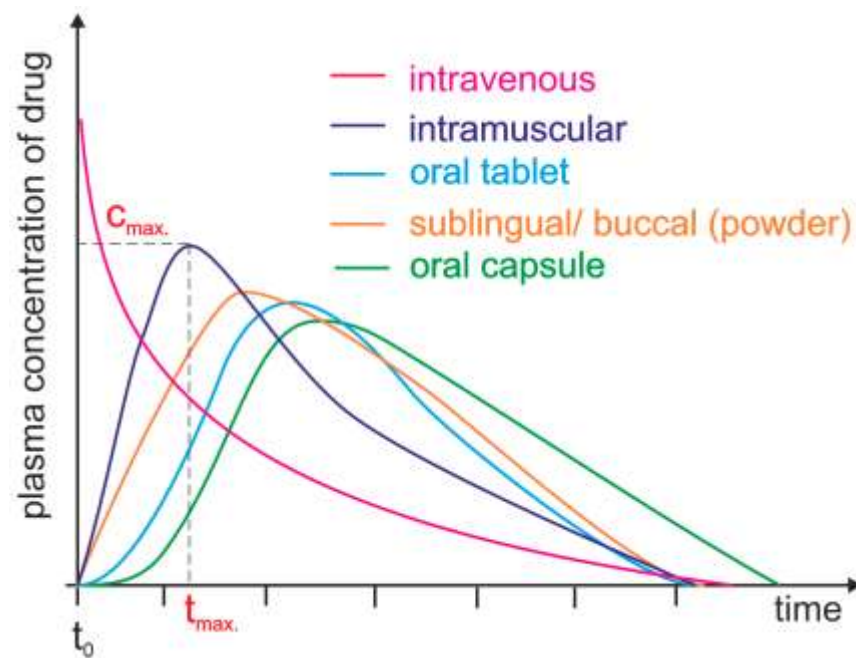
FACTORS AFFECTING ABSORPTION



ROUTES OF ADMINISTRATION

- Oral: Convenient, but first-pass effect.
- Intravenous: Direct, 100% absorption.
- Subcutaneous/Intramuscular: Steady absorption.
- Topical: Local, low systemic.
- Inhalation: Rapid for lungs.
- Rectal: Avoids first-pass partially.
- Sublingual: Rapid, bypasses liver.
- Transdermal: Steady, for lipophilic drugs.
- Nasal/Inhalation: Quick onset.

BIOAVAILABILITY

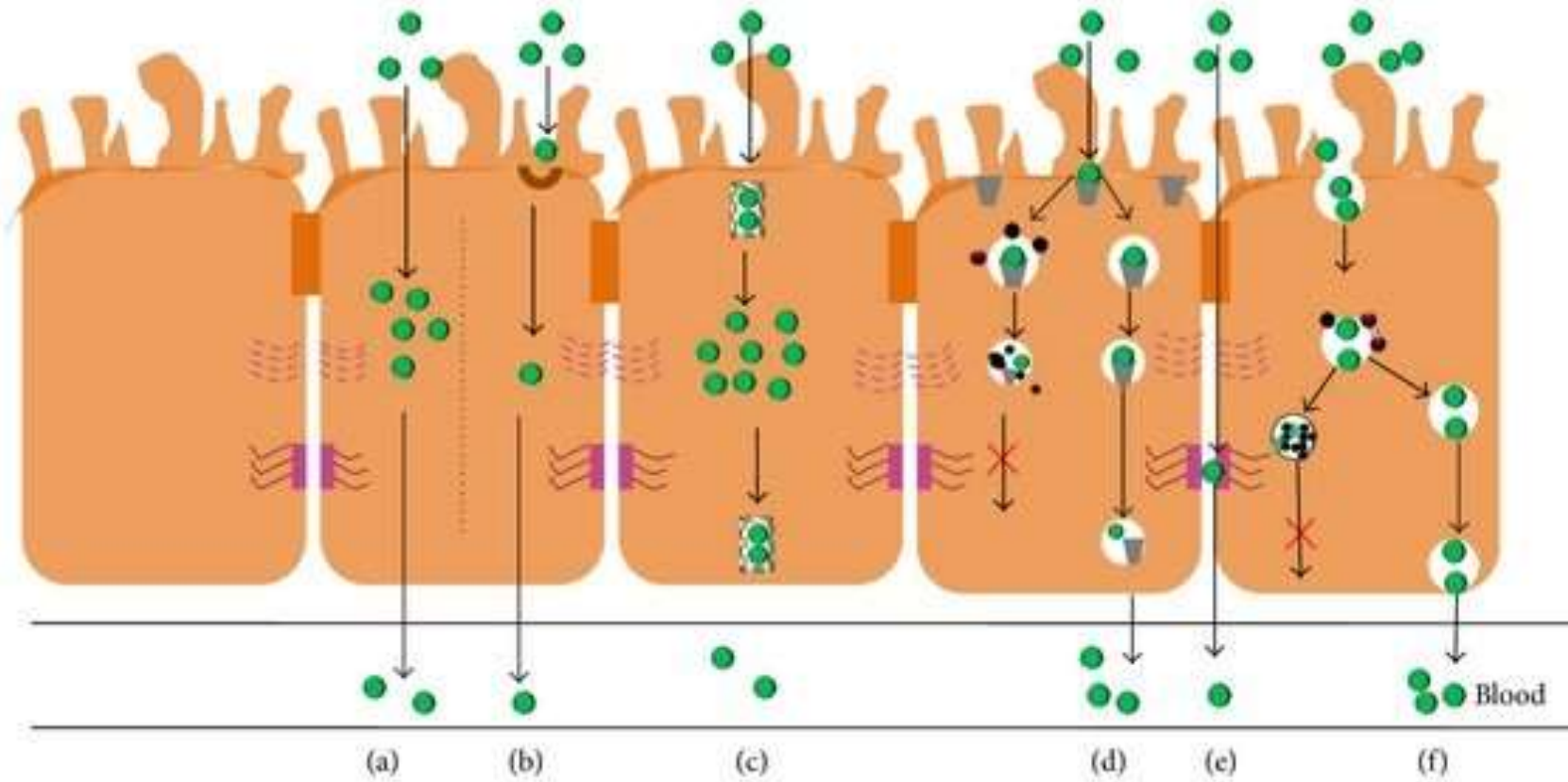


CLASS ASSESSMENTS

FIND OUT THE MECHANISM OF DRUG ABSORPTION



ANSWER



- (a) Transcellular transport;
- (b) active transport
- (c) facilitated diffusion
- (d) receptor-mediated endocytosis
- (e) paracellular transport
- (f) pinocytosis

SUMMARY

- Pharmacokinetics studies drug movement (ADME), with absorption as the entry step.
- Mechanisms include passive, active, etc. Factors like pH, solubility influence it.

Understanding aids better drug use.

REFERENCE

- Rang & Dale's Pharmacology, 9th Edition, Elsevier, 2019.
- Goodman & Gilman's: The Pharmacological Basis of Therapeutics, 13th Edition, McGraw-Hill, 2018.
- Text book of Pharmacology by KD Tripathi.

